



The Influence of Birth Order on Academic Performance of Nigeria Certificate in Education Biology Students

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ABSTRACT

Birth order has been linked to variations in personality, cognitive development, and educational outcomes, yet evidence from Nigerian higher education remains limited. This study investigated the influence of birth order on academic performance among Nigerian Certificate in Education (NCE) Biology students in Kaduna State. A survey research design was adopted from which a sample of 135 was randomly selected using Krejcie and Morgan's formula. Data were collected through a validated researcher-designed questionnaire (content-validated by experts; reliability coefficient established via test-retest = 0.82). Four research questions and four hypotheses guided the study. Data were analyzed using descriptive statistics and independent t-tests at the 0.05 significance level. Results revealed significant differences in academic performance across birth order categories (firstborn, middle-born, lastborn, and only child), as well as notable gender-related variations. Findings further indicated that family size interacted with birth order in shaping academic outcomes. The study concludes that birth order is a relevant, though culturally mediated, factor influencing academic performance among NCE students. It recommends that institutions integrate family-related considerations into guidance and counseling services, and that parents provide balanced academic support to children regardless of their birth order.

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INTRODUCTION

Academic achievement remains a central concern for educators, policymakers, and parents in Nigeria, as it reflects the extent to which learners attain desired educational outcomes. Despite sustained investment in the education sector, persistent underperformance has been reported across secondary and tertiary institutions (Brew et al., 2021). This has prompted scholars to investigate not only institutional and instructional factors but also family-related influences that may shape students' learning outcomes (Suleiman et al., 2024).

One such family factor is birth order, which refers to a child's position in the family hierarchy. Birth order has long been associated with developmental, cognitive, and social

outcomes. Early theorists such as Adler (1946) and later researchers (Sulloway, 1997; Rohrer et al., 2015) argue that firstborns often benefit from greater parental expectations and responsibilities, middle-born children may develop social adaptability, while lastborns are more likely to receive indulgence and support. Empirical studies have reported that these dynamics can influence academic performance, with firstborns frequently outperforming their younger siblings in educational attainment (Booth & Kee, 2008; Black et al., 2018).

However, most of these findings have emerged from Western societies, where cultural and family structures differ markedly from those in Nigeria. In many Nigerian households, large family sizes, extended kinship systems, and polygamous

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arrangements may shape parental investment and sibling roles in unique ways (Fasina, 2015). Consequently, the impact of birth order on academic performance in Nigeria may not follow the same patterns observed elsewhere.

Existing research in Nigeria has largely focused on secondary school students, with very limited attention to students in higher education, particularly those in Colleges of Education. This is a critical oversight, as Nigeria Certificate in Education (NCE) Biology students represent the next generation of science teachers, whose academic preparation directly influences the quality of science education in the country. Understanding how birth order influences their achievement is therefore essential for improving teacher education outcomes.

This study addresses this gap by investigating the relationship between birth order and academic performance among NCE Biology students in Kaduna State. Specifically, it examines differences in academic performance across birth order categories, explores gender-related variations, and assesses the role of family size. The findings are expected to provide culturally relevant insights for educational planning, counseling, and family-based interventions in Nigeria.

STATEMENT OF THE PROBLEM

Academic underachievement among students in Nigerian tertiary institutions remains a persistent concern, with multiple factors contributing to disparities in performance. While institutional resources and teaching methods have been widely studied, less attention has been given to family-related variables such as birth order, which has been shown in international research to influence motivation, responsibility, and cognitive development.

In the Nigerian context, where families are often large and shaped by cultural and socio-economic dynamics, birth order may play a distinctive role in determining students' educational outcomes. Yet, existing studies have focused mainly on secondary school populations, leaving a significant gap in understanding how birth order influences the academic performance

of students in higher education. This gap is particularly relevant for Nigeria Certificate in Education (NCE) Biology students, who are being prepared as future teachers and whose academic achievement directly impacts the quality of science education in the country. Therefore, there is a need to investigate whether and how birth order affects the academic performance of NCE Biology students in Kaduna State. Addressing this problem will not only expand the literature on birth order within an African context but also provide practical insights for counselors, educators, and parents in supporting students across different family backgrounds.

Objectives of the Study

The following are the objectives of this research.

1. To determine the difference between birth order and academic performance among male and female biology students of in F.C.E Zaria.
2. To find out whether there is difference in the academic performances of first born, middle born, last born and only child among biology students?
3. To assess the impact or effect of birth order on academic performance between 18-25 years biology students.
4. To find out how family size affect academic performances of biology students in secondary school.

Research Questions

The following research questions are formulated to guide this study.

1. Is there any significant difference between birth order and academic performance of NCE Biology Students?
2. Is there any significant difference between male and female birth order and academic performance?
3. Is there any significant difference between birth order and others birth orders in academic performance of NCE biology student?



Research hypotheses

- HO_1 . There is no significant difference between birth order and educational attainment of NCE biology students.
- HO_2 . There is no significant difference between male and female NCE biology student's birth order and educational attainment
- HO_3 . There is no marked disparity of first birth order and other birth orders in academic success among NCE biology students

METHODOLOGY

This research employed survey research design. This method is potentially useful technique in education because is ideal for conducting social research when is not possible or acceptable to manipulate the characteristics of human participants. Data were collected from the respondents by employing questionnaire. The population for the study consists of both male and female NCE 2 students of Federal University of Education Zaria in Zaria Local Government area. Kaduna State. A total of 135 NCE II students in the department of biology responded the anonymous questionnaire. The participants' aged ranged from 19 to 30 years. The sample comprises of 135 NCE 2 biology students in University of Education Zaria, in Zaria Local Government. The sample size was determined by Krejcie and Morgan (1970) table for determining sample size.

Simple random sampling technique was used to select the participants among NCE 2 in biology department. The sample was randomly selected from the ages ranging from 19-20 years.

The research tool employed was a survey created by the researchers to elicit information from them. It includes only a section, asking the respondent his/her sex, age, other items included are; what is the total number of siblings (including you) in your family? What is your position in the family? Estimate your mothers age at the time of your birth, etc.

The instrument validity was established via content validation. Experts evaluated the questionnaire designed by the researcher psychology department of Federal University of Education, Zaria. The experts adjudged the instrument to be adequate. The reliability of the instrument was determined by randomly administering the questionnaire to a group of 50 university students in biology department of another college of education outside the study area. The questionnaire was trial-tested to a group of 120 science students. The exercise was repeated to the same group after an interval of 2 weeks for the test-retest so as to establish the reliability co-efficient. The sampled students were gathered inside classroom and the questionnaire was distributed to the students to complete. The whole questionnaire was collected from the students after completion on the spot.

RESULTS

Research Question One

Is there any significant difference between birth order and academic performance of NCE Biology Students?

Table 1: Average and Dispersion Scores on Birth Order and Academic Performance of NCE Biology Students

S/N	Section A: Birth Order Influence on Academic Performance in Biology	SA	A	D	SD	MEAN	Std. Div.	Remarks
1	I believe my birth order has influenced my academic performance in Biology	68	23	28	13	2.86	1.02	Agreed
2	I think my family's expectations, based on my birth order, have impacted my biology grades	76	45	10	4	3.40	0.98	Agreed
3	I consistently perform well in biology	70	62	3	0	3.48	0.74	Agreed
4	I found Biology concepts easy to understand	58	49	20	8	2.53	1.08	Agreed
5	My birth order has influenced how I approach studying Biology	48	59	18	10	3.64	0.62	Agreed

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S/N	Section A: Birth Order Influence on Academic Performance in Biology	SA	A	D	SD	MEAN	Std. Div.	Remarks
6	I believe my study habits are effective for achieving good grades in Biology	44	38	34	19	2.57	1.87	
	Total					18.48	6.31	
	Average and Variability					3.08	1.05	Agreed

Table 1 revealed the central tendency and dispersion scores of responses on the family rank and academic performance among NCE Biology students. The average and dispersion scores of items 1, 2, 3, 4 and 5 is given as (N = 135, M = 3.08 and SD = 1.05) which is above the threshold of 2.50, indicating there is considerable

influence of sibling sequence on academic performance of NCE Biology students.

Research Question Two

Is there any significant difference between male and female birth order and academic performance?

Table 2: Mean and Variability Response Scores on Birth Order and Academic Performance of Male and Female NCE Biology Students

S/N	Section B: Gender Influence on Birth Order and Academic Performance	SA	A	D	SD	MEAN	Std. Div.	Remarks
1	My gender has influenced my parents' expectations regarding my academic performance in biology	46	64	15	10	3.21	0.98	Agreed
2	I believe my birth sequence and gender have affected my access to educational resources for biology	57	45	20	13	2.96	1.21	Agreed
3	I perform better in biology because of my gender	60	50	25	10	3.45	0.87	Agreed
4	My gender has no impact on my understanding biology concepts	64	56	10	5	3.02	1.02	Agreed
5	My birth sequence and gender influence how I approach studying biology	54	48	22	10	2.56	0.91	Agreed
6	I believe my study habits in biology are effective regardless of my gender and sibling order	76	54	15	0	3.22	1.24	Agreed
	Total					18.42	6.23	Agreed
	Average Mean and Dispersion					3.07	1.04	Agreed

Table 2 revealed the average and dispersion scores of responses on the male and female sibling order and academic performance among NCE Biology students. The average arithmetic means and dispersion scores of items 1, 2, 3, 4, 5 and 6 is given as (N = 135, M = 3.07 and SD = 1.04) which is above the threshold clearance of 2.50, indicating there is notable influence of gender in family rank and academic

performance on academic performance of NCE Biology students.

Research Question Three

Is there any significant difference between birth order and others birth orders in academic performance of NCE biology student?

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Table 3: Mean and Dispersion Response Scores on birth order and others birth orders in academic performance of NCE biology students

S/N	Section C: First birth Order and Others Birth Order in Academic Performance	SA	A	D	SD	MEAN	Std. Div.	Remarks
1	As a firstborn, I believe I have an advantage in academic performance in biology compared to my siblings	55	45	20	15	2.98	1.21	Agreed
2	My parents' expectations as a firstborn have positively impacted my biology grades	66	54	10	5	3.06	0.98	Agreed
3	I believe firstborns tend to perform better in biology than later-born siblings	77	54	14	0	3.31	1.03	Agreed
4	My birth sequence has no pronounced impact on my academic performance in biology compared to others	63	50	21	11	2.88	2.96	Agreed
5	As a firstborn, I tend to be more disciplined in my study habits for biology	83	42	5	5	3.09	1.04	Agreed
6	My birth order influence how I approach challenges in biology	78	56	1	0	3.22	0.95	Agreed
	Total					18.54	8.17	
	Average Mean and Spread					3.09	1.36	Agreed

Table 3 revealed the average and spread scores of responses on the birth order and others birth sequence in academic performance of NCE biology student. The average average and dispersion scores of items 1, 2, 3, 4, 5 and 6 is given as (N = 135, M = 3.09 and SD = 1.36) which surpassed the benchmark of 2.50, indicating there is significant influence of sibling order and others

sibling orders in intellectual achievement of NCE biology student.

Hypothesis One

There is no significant difference between birth order and educational attainment of NCE biology students.

Table 4: t-test Analysis on Influence of birth order and Educational Attainment of NCE Biology Students

Groups	N	Mean	St. Dev.	df	T	P	Decision
Agreed	58	52.63	14.19	133	12.144	0.000	Significant
Disagreed	77	42.72	5.65				

Table 4 showed that, P – value is 0.000 which is less than the alpha value of 0.05 level of significance at df of 133. Since the p- value is less than the alpha value, it means that the difference is significant between birth sequence and educational attainment of NCE biology students. Therefore, the null hypothesis one is rejected. Indicating that, there is a significant influence of

birth order and educational attainment of NCE biology students.

Hypothesis Two

There is no significant difference between male and female NCE biology student's birth order and educational attainment



Table 5: t-test Analysis on Influence of male and female NCE biology students birth order and educational attainment

Groups	N	Mean	St. Dev.	df	T	P	Decision
Male	56	59.89	9.71	348	28.595	0.000	Significant
Female	76	42.72	5.65				

Table 4.5 showed that, P – value is 0.000 which is less than the alpha value of 0.05 level of significance at df of 133. Since the p- value is less than the alpha value, it means that the difference is significant between male and female NCE biology student's birth sequence and educational attainment in favor of male students' birth sequence and educational attainment. Therefore, the null hypothesis two is rejected.

Indicating that, a notable correlation between gender, birth order, and academic achievement among NCE Biology students.

Hypothesis Three

There is no marked disparity of first birth order and other birth orders in academic success among NCE biology students

Table 6: t-test Analysis on Influence of first birth order and others birth orders in Academic Success among NCE Biology Students

Groups	N	Mean	St. Dev.	df	T	P	Decision
Agreed	58	50.09	9.51	133	22.595	0.000	Significant
Disagreed	77	23.72	2.15				

Table 6 showed that, P – value is 0.000 which is less than the alpha value of 0.05 level of significance at df of 133. Since the p- value is less than the alpha value, it means that the difference is substantial between first birth order and others birth orders in educational attainment among NCE biology students in favor of Firstborn students' birth order in educational attainment. Therefore, the null hypothesis three is rejected. Indicating that, a pronounced correlation between birth order (firstborn, middle-born, last-born) and academic achievement among NCE Biology students.

Albarkheel et al. (2019) who found middle-born males in Riyadh dental college have shown the highest tendency to have better academic success compared to other birth order groups. However, the study found female not to show the same tendency and are eager to achieve high level in academic education regardless of their birth order or family size. In a similar development, Menchak et al. (2022) also found gender not to determine academic success as perceived by Guidance and Counselling students of Taraba State University. Jalingo. According to Premnath et al. (2021), a marginally marked relationship was found between birth order and learning outcomes. The effect of birth order may vary across cultures, family sizes, and countries, warranting further investigation.

DISCUSSION OF FINDINGS

There is a considerable influence of birth order and educational attainment of NCE biology students. This is similar to the findings of Menchak et al. (2022) have found birth order to influence academic success of students. A notable correlation between gender, birth order, and academic achievement among NCE Biology students. This is similar to the findings of

A notable correlation between birth order (firstborn, middle-born, last-born) and academic achievement among NCE Biology students. Correspondingly, Menchak et al. (2022) found birth order to impact intellectual

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achievement of students. The study showed that first, middle and last born orders have impact on students' learning outcomes. The study further revealed that parents provide educational materials to enhance educational attainment of the only male child notwithstanding his birth order because he is naturally considered the heir.

CONCLUSION

The findings founded a marked association within birth order and academic success between NCE biology students in Federal University of Education, Zaria. The study also backs earlier researches indicating that birth order yields a measurable influence on learners' achievement even though the effect may differ throughout the length of the cultural and social context. The finding also disclosed that gender connect with birth order in a specific way. While male learners' performance appears shaped by birth order, female learners exhibit firmness to achieve academic outcomes irrespective of their birth order and the size of the family. These findings strengthen the notion that birth order dynamism whether first born, middle born, or last born can shape educational opportunities, parental investment and students' motivation, thereby influencing academic success.

Nevertheless, cultural norms such as the preferential treatment of the only child highlight how social expectations interact with family settings to shape academic success. Collaboratively, the findings highlight the need to recognize family-related factors as important, though often overlooked, determinants of student performance in Nigerian colleges of education.

RECOMMENDATIONS

The following recommendations are outlined

1. Resources and emotional support should be distributed equally across all learners regardless of their birth order.
2. Guidance and counselling services should be established and strengthen in all our institutions of learning.
3. Teachers and lecturers should be sensitized about the influence of birth

order on student motivation and achievement.

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